PROGRESS REPORTS

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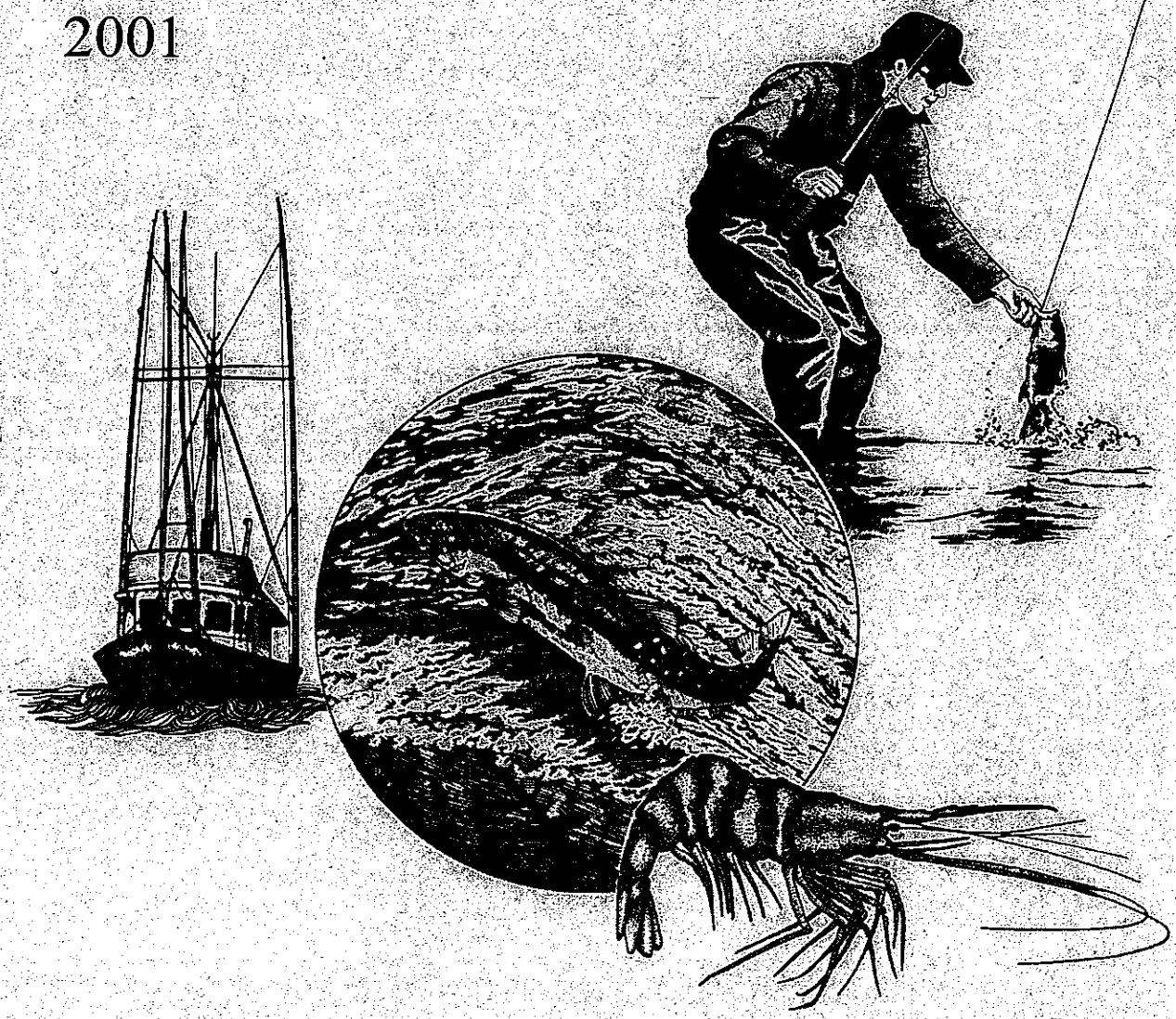
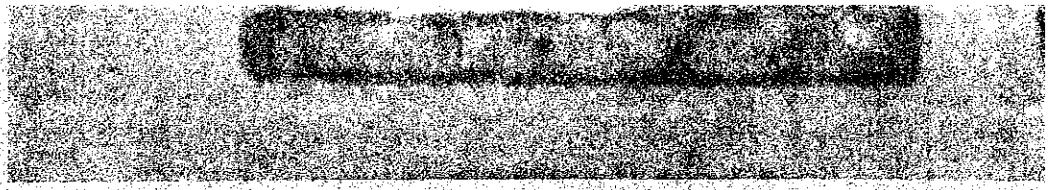


FISH DIVISION

Oregon Department of Fish and Wildlife

Summer Steelhead Creel Surveys on the Grande Ronde, Wallowa, and Imnaha Rivers for the 1999-2000 Run Year



ANNUAL PROGRESS REPORT

FISH RESEARCH PROJECT
OREGON

PROJECT TITLE: Summer Steelhead Creel Surveys on the Grande Ronde, Wallowa, and Imnaha Rivers for the 1999-2000 Run Year

AGREEMENT NUMBER: 14110-0-J048

PROJECT PERIOD: 1 April 2000 to 31 March 2001

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This project was financed by the U.S. Fish and Wildlife Service under the Lower Snake River Compensation Plan.

PREFACE

This report is for the funding period 1 April 2000 to 31 March 2001. The sampling period was from 1 September 1999 to 15 April 2000. The report summarizes statistical angler surveys conducted during the summer steelhead angling season in major fishing areas on the Grande Ronde, Wallowa, and Imnaha Rivers. Hatchery adult steelhead harvested during the 1999-2000 run year were primarily from the 1996 and 1997 brood years. Results of creel surveys conducted prior to fall 1999 are reported in previous Lower Snake River Compensation Plan evaluation annual reports (Carmichael et al. 1986, 1987, 1988, 1989, 1990; Flesher et al. 1991, 1992, 1993, 1994, 1995, 1996, 1997, 1999, 2000). The steelhead angling season reported in this document, during which only adipose fin-clipped fish could be kept, was open from 1 September 1999 to 15 April 2000 in the Grande Ronde and Imnaha River basins.

ACKNOWLEDGMENTS

We would like to thank Dan Herrig for his review of the report, Mary Buckman for the statistical design and analysis of the data, Rodger Johnson and Debbie Artimez for their dedication in conducting the surveys. We would also like to thank Joe Bumgarner and Steve Martin (Washington Department of Fish and Wildlife) for coordination and John Johnston for conducting the Lower Grande Ronde survey during spring, 2000. This project was financed as a cooperative agreement between the Oregon Department of Fish and Wildlife and the U.S. Fish and Wildlife Service under the Lower Snake River Compensation Plan.

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SUMMARY

Angler effort, catch, and harvest during the 1999-2000 run year increased and catch rates improved from the previous year (1998-1999) in both the lower Grande Ronde and Imnaha survey areas. Catch rates were also greater than the previous year in all areas except on the upper Grande Ronde River. Hatchery summer steelhead dominated the catch in 10 of the 18 months surveyed in the Grande Ronde and Imnaha River basin fisheries. Anglers harvested more one-ocean compared to two-ocean hatchery steelhead in Grande Ronde fisheries and more two-ocean than one-ocean fish in the Imnaha fishery. In addition, anglers harvested similar numbers of males and females in Grande Ronde fisheries and more females than males in the Imnaha fishery. The percentage of anglers from Oregon counties other than Union or Wallowa (local anglers) was higher than average and accordingly, the percentage of local anglers was lower than average in summer steelhead fisheries during the 1999-2000 run year in both basins. We sampled adipose fin-clipped and left ventral fin-clipped plus coded-wire-tagged (AdLV+CWT) summer steelhead in both the Grande Ronde and Imnaha basin fisheries, except in Catherine Creek and the upper Grande Ronde River. Expanded estimates for entire fisheries will not be determined until statewide annual harvest card (tag) summaries become available.

INTRODUCTION

Summer steelhead (*Oncorhynchus mykiss*) fisheries in the Grande Ronde and Imnaha basins were closed in 1974. This closure was prompted by declining adult returns, as indicated by adult counts at Ice Harbor Dam on the Snake River (U.S. Army Corps of Engineers 1996) and low steelhead redd counts on index streams in the Grande Ronde and Imnaha basins (Oregon Department of Fish and Wildlife District Annual Reports 1949-1974). The Lower Snake River Compensation Plan (LSRCP), initiated by Congress in 1976, was developed to compensate for losses of anadromous salmonids in the Snake River basin from construction of the four lower Snake River Dams built between 1962 and 1976. Thus, the focus of the LSRCP is above Lower Granite Dam (Rkm 173), the uppermost of the four lowest dams on the Snake River. One of the primary objectives of the LSRCP in Oregon is to restore historic recreational and tribal fisheries for summer steelhead in the Grande Ronde and Imnaha basins (Carmichael 1989). Approximately 1.68 M steelhead smolts were released in Oregon each year during April and May in the Grande Ronde and Imnaha basins until 2000. Beginning in 2000, releases were reduced to approximately 1.20 M due primarily to concerns by the National Marine Fisheries Service (NMFS) with straying of Wallowa stock hatchery adults returning to the Grande Ronde basin. These fish provide hatchery adult returns that contribute to recreational fisheries and may supplement natural spawning populations in northeast Oregon. Consumptive recreational fisheries for summer steelhead re-opened in 1986, primarily as a result of increases in hatchery adult returns.

We began creel surveys for summer steelhead during the fall of 1985 in both the Grande Ronde and Imnaha basins. The goal of these surveys is to provide annual

harvest information needed to assess LSRCP compensation goals (Carmichael and Wagner 1983). In general, the number of summer steelhead in the recreational fishery has been restored to historic values, but the fishery is concentrated at different times and places (Flesher et al. 1994). This report summarizes results of creel surveys conducted during the fall of 1999 and the spring of 2000 in the Grande Ronde and Imnaha basins. The Grande Ronde and Imnaha basins encompass the major steelhead fisheries in Oregon that occur in streams which drain into the Snake River upstream of Lower Granite Dam.

STUDY AREA

Creel surveys on the Grande Ronde River were conducted on a lower 24 km section from the Oregon-Washington state line (Rkm 62) upstream to Wildcat Creek (Rkm 86) and an upper 39 km section from the Highway 82 bridge at Island City (Rkm 256) upstream to Meadow Creek (Rkm 295; Figure 1). The survey on Catherine Creek was conducted on a 22 km section from the Highway 203 bridge below the town of Union (Rkm 24) upstream to the Highway 203 bridge above Catherine Creek State Park (Rkm 46). Surveys on the Wallowa River were conducted on a 6 km section from its confluence with the Grande Ronde River at Rondowa (mouth of the Wallowa River) upstream to Howard Creek (Rkm 6) and a 50 km section from Minam State Park (Rkm 13) upstream to the mouth of Trout Creek (Rkm 63) near Enterprise. Anglers who parked their vehicles at Minam State Park to fish just below the park were included in the survey. Because vehicle access into Rondowa was limited, most anglers parked their vehicles at Palmer Junction, located 5.6 km upstream of Rondowa on the Grande Ronde River. Thus, for the Rondowa survey, we interviewed anglers leaving the parking area at Palmer Junction when they were encountered. The survey on the Imnaha River was conducted on the lower 32 km from its confluence with the Snake River (Rkm 0) upstream to the mouth of Big Sheep Creek (Rkm 32) near the town of Imnaha (Figure 1).

METHODS

For the lower Grande Ronde River survey, we used the methodology described by Carmichael et al. (1988). We sampled 50% of the weekends and holidays and 30% of the weekdays during each month of each survey. Initially, sample days were chosen randomly in two-day blocks. They were then adjusted to equally represent days within two time periods (weekend days and holidays, and weekdays). Weekend days and holidays included Saturday, Sunday, and holidays (71 total days sampled) and weekdays included Monday through Friday (except for holidays; 157 total days sampled). Each sample day, beginning at a randomly selected start time, the creel surveyor conducted a pressure count by tallying all anglers and vehicles every three hours while driving a vehicle along the entire survey route. Between pressure counts, the surveyor interviewed anglers by recording a description of each angler and their

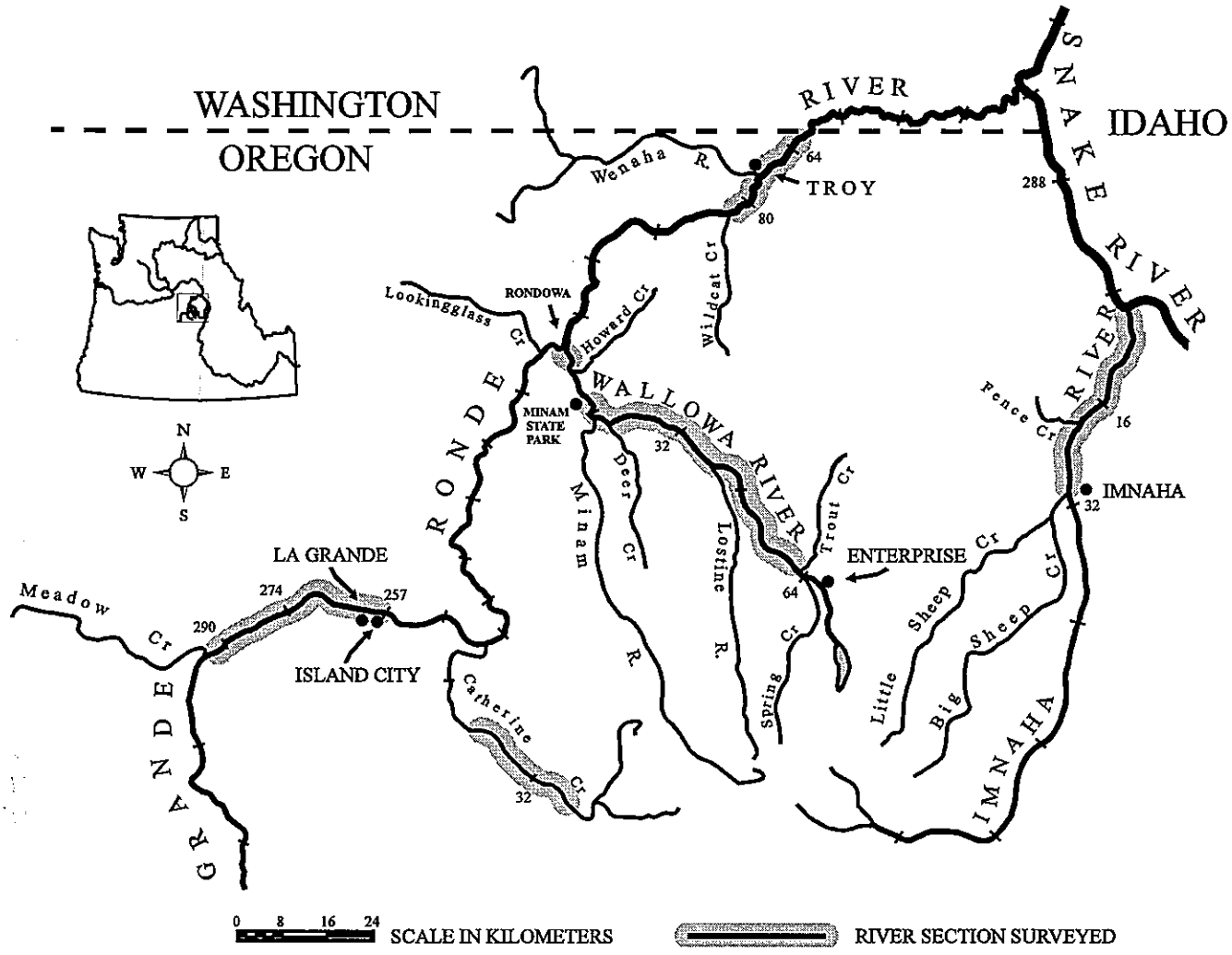

Figure 1. Map of northeastern Oregon showing where summer steelhead creel surveys were conducted in the Grande Ronde and Imnaha basins during the 1999-2000 run year.

vehicle, their residence, the number of hours they had fished, and the number and species caught. The surveyor also sampled all harvested fish by recording fork length (mm), sex, fin clip, and any external tags. If the fish was coded-wire-tagged (CWT), as indicated by an adipose fin-clip and left ventral fin-clip (AdLV), the surveyor asked permission from the angler, then excised the snout behind the eye and placed it with an identification number in a plastic bag for later processing. For the Imnaha River survey, we used a check station for the area below Fence Creek (Rkm 23) and a roving survey in the area above Fence Creek. The check station was designed so that anglers leaving the lower river area during a sample day would stop voluntarily and the surveyor would interview each angler and sample all harvested fish. At the end of the second sample day, the surveyor would drive to Cow Creek (Rkm 7) and interview all anglers for that day and the previous sample day. For the roving survey we followed the same procedures as on the lower Grande Ronde River survey except that the surveyor interviewed anglers during pressure counts. For each pressure count the surveyor closed the check station, interviewed and enumerated all anglers from Fence Creek to the town of Imnaha, then returned. Time spent away from the check station was recorded and later expanded.

For the upper Grande Ronde River, Rondowa, Wallowa River, and Catherine Creek survey areas, one surveyor conducted angler interviews from 1 February to 15 April 2000. We randomly selected survey areas and a minimum of two areas were surveyed each sample day. Each sample day, the surveyor drove the survey route, stopped to interview anglers, then drove to the next area and repeated this sequence. If sufficient time was available, the surveyor included and interviewed anglers in a third area. All harvested fish observed were sampled. We sampled 100% of the weekends and from 40-60% of the weekdays. From 1 February to 29 February, we surveyed five days each week from 0800-1700. From 1 March to 15 April, we surveyed four days each week from 0700-1800.

During the lower Grande Ronde and Imnaha river creel surveys, we estimated angler effort in hours and days, total catch, harvest, catch rate, percent hatchery fish in the catch, and the number of AdLV+CWT marked fish harvested (see Carmichael et al. 1988). In all other areas, we estimated catch rate and percent hatchery fish in the catch. In addition, we determined age and sex composition and mean fork length of harvested fish in all survey areas. Catch rate was expressed as an index, hours per fish, in which lower index values (hours per fish) indicate better angling success and higher index values indicate poorer angling success. The survey on the lower Grande Ronde River was from 1 September 1999 to 15 April 2000. Surveys on the upper Grande Ronde, Wallowa, and Imnaha Rivers were from 1 February to 15 April 2000. The Rondowa survey was from 15 February to 15 April 2000. The Catherine Creek survey was from 1 February to 29 February 2000.

ACCOMPLISHMENTS AND FINDINGS

On the lower Grande Ronde River, we sampled an average of 56.4% of the weekends and holidays and 31.6% of the weekdays each month for a total of 86 sample days. On the upper Grande Ronde River, we sampled an average of 76.4% of the weekends and holidays and 34.9% of the weekdays each month for a total of 37 sample days. On Catherine Creek, we sampled an average of 48.1% of the weekends and holidays and 21.4% of the weekdays each month for a total of 24 sample days. On the Wallowa River, we sampled an average of 84.7% of the weekends and holidays and 43.0% of the weekdays each month for a total of 42 sample days. On the Imnaha River, we sampled an average of 65.6% of the weekends and holidays and 34.9% of the weekdays each month for a total of 32 sample days.

We estimated that 2,172 anglers fished for 11,112 hours on the lower Grande Ronde River. They caught and released 474 wild and 120 hatchery steelhead and kept 380 hatchery steelhead for a catch rate index of 11 hours per fish (Figures 2-6, Appendix A-1). The percent of steelhead caught that were hatchery fish ranged from 0% in April 2000 to 86% in January 2000 (Figure 7, Appendix B). Mean fork length (±95% confidence interval) of harvested hatchery steelhead was 627 (±12) mm for males and 622 (±16) mm for females (Table 1). Age composition of harvested hatchery steelhead was 77% 1:1's (one year spent in freshwater: one year spent in saltwater) and 23% 1:2's (one year spent in freshwater: two years spent in saltwater). Sex composition was 53% male and 47% female (Table 1). Seventy-five percent of the anglers were from Union or Wallowa counties, 18% were from other Oregon counties, 3% were Washington State residents and 4% resided outside the states of Oregon and Washington (Table 2). On the lower Grande Ronde River, anglers harvested an estimated 5 AdLV+CWT marked steelhead from our hatchery releases and an estimated 2 AdLV+CWT marked steelhead that were strays from Washington Department of Fish and Wildlife releases on the Tucannon River, Washington (Table 3).

On the upper Grande Ronde River, the catch rate index averaged 25 hours per fish (Figure 4, Appendix A-2). The percent of steelhead caught that were hatchery fish ranged from 0% in April to 57% in March (Figure 7, Appendix B). Mean fork length (±95% confidence interval) of harvested hatchery steelhead was 652 (±64) mm for females (Table 1). Age composition of harvested hatchery steelhead was 75% 1:1's and 25% 1:2's. Sex composition was 25% male and 75% female (Table 1). Eighty-nine percent of the anglers were from Union or Wallowa counties, 10% were from other Oregon counties and 1% resided outside the states of Oregon and Washington (Table 2).

No fish were caught on Catherine Creek despite 10.1 angler hours of effort (Figures 4 and 7, Appendices A-3 and B). Seventy-eight percent of the anglers were from Union or Wallowa counties and 22% were from other Oregon counties (Table 2).

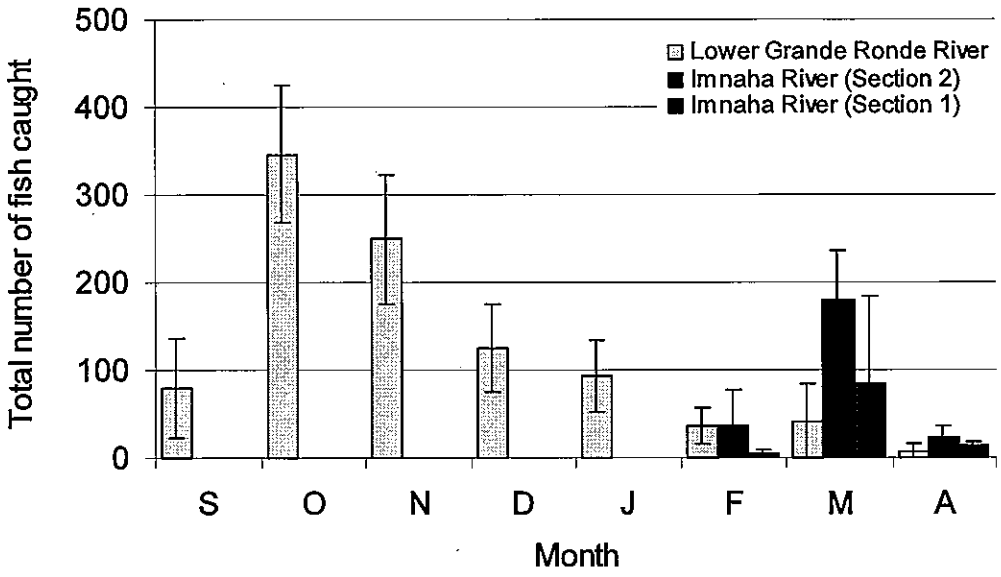

Figure 2. Estimated total catch of summer steelhead (±95% C.I.'s) on the lower Grande Ronde River and two sections of the Imnaha River during the 1999-2000 run year. Surveys were conducted from 1 September 1999 to 15 April 2000 on the lower Grande Ronde River and from 1 February to 15 April 2000 on the Imnaha River.

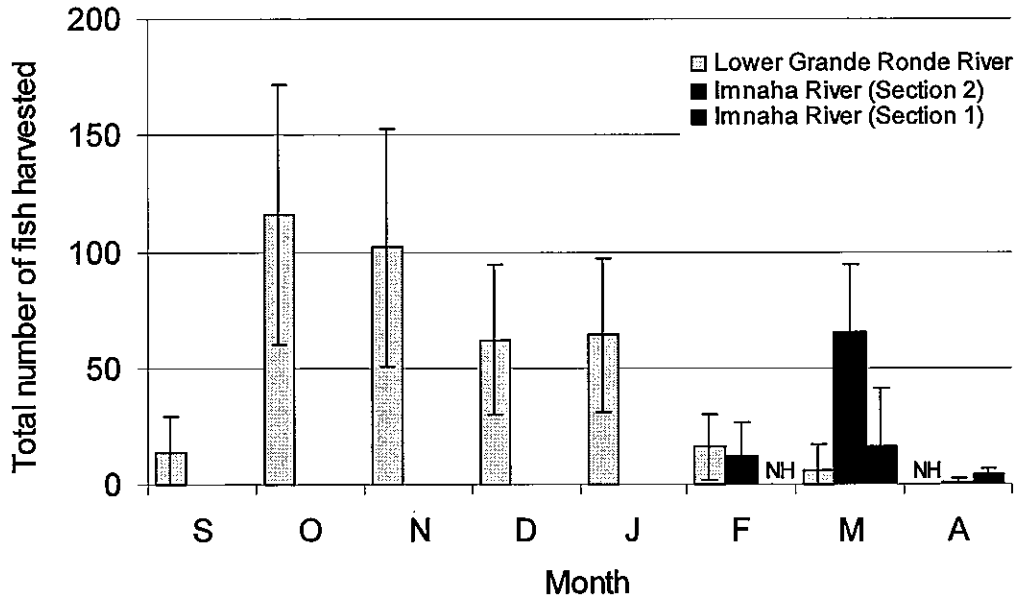

Figure 3. Estimated total harvest of summer steelhead (±95% C.I.'s) on the lower Grande Ronde River and two sections of the Imnaha River during the 1999-2000 run year. NH indicates no harvest. Surveys were conducted from 1 September 1999 to 15 April 2000 on the lower Grande Ronde River and from 1 February to 15 April 2000 on the Imnaha River.

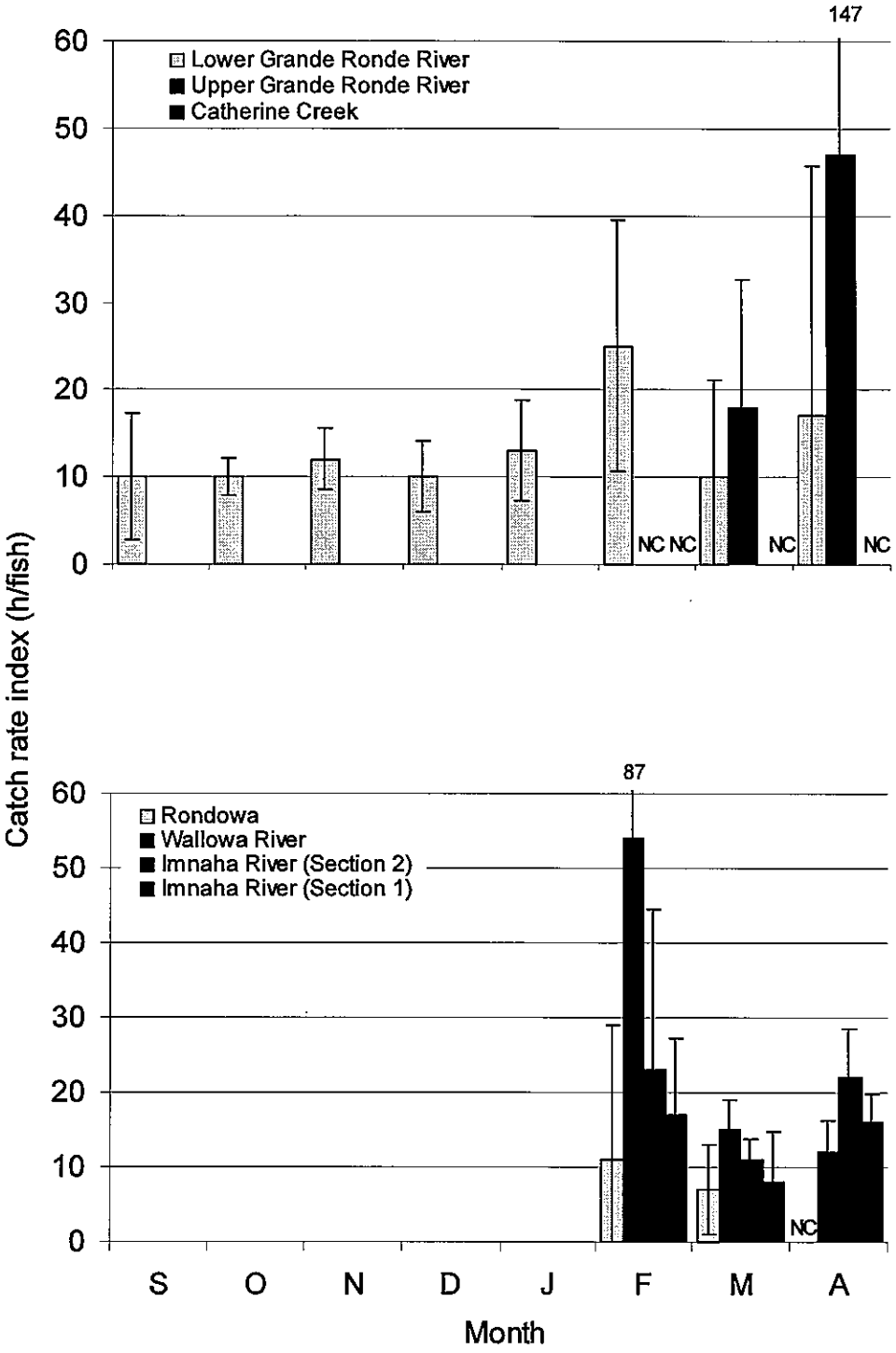

Figure 4. Estimated catch rate index (h/fish) for summer steelhead (±95% C.I.'s) in the Grande Ronde and Imnaha basins during the 1999-2000 run year. NC indicates no catch. Survey areas and times include the lower Grande Ronde River (1 September-to 15 April), upper Grande Ronde River, Catherine Creek, Rondowa, Wallowa River, and two sections of the Imnaha River (1 February-15 April). Note: A lower catch rate index implies better angling success.

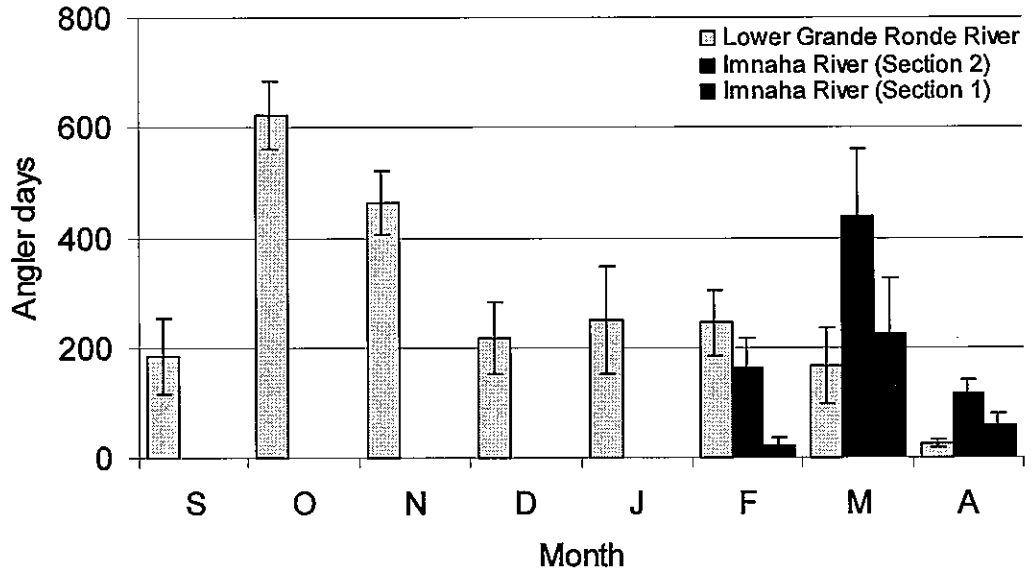

Figure 5. Estimated number of angler days for summer steelhead (±95% C.I.'s) on the lower Grande Ronde River and two sections of the Imnaha River during the 1999-2000 run year. Surveys were conducted from 1 September 1999 to 15 April 2000 on the lower Grande Ronde River and from 1 February to 15 April 2000 on the Imnaha River.

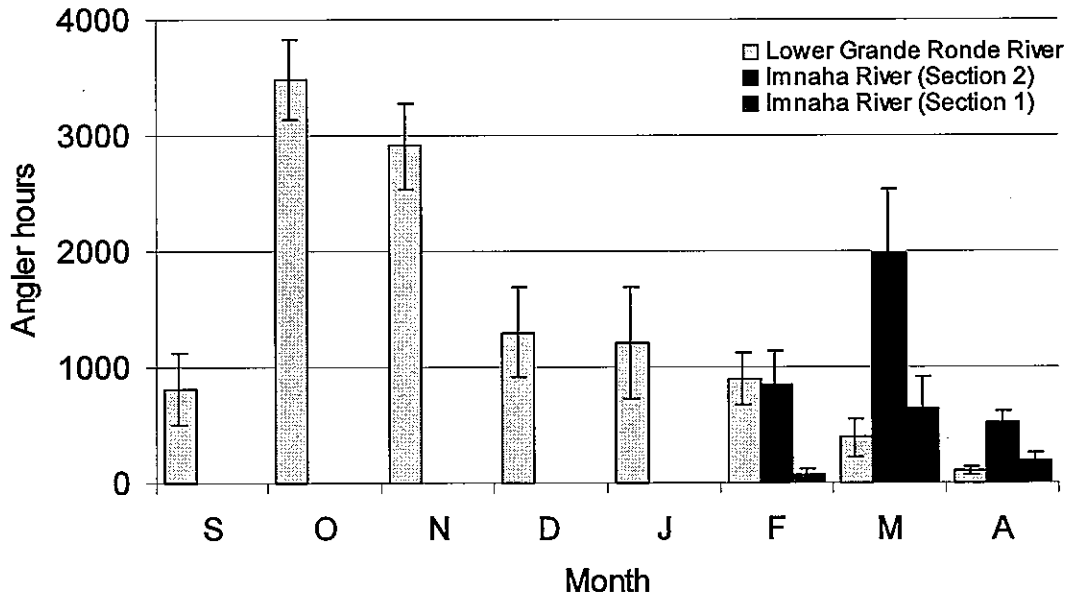

Figure 6. Estimated number of angler hours for summer steelhead (±95% C.I.'s) on the lower Grande Ronde River and two sections of the Imnaha River during the 1999-2000 run year. Surveys were conducted from 1 September 1999 to 15 April 2000 on the lower Grande Ronde River and from 1 February to 15 April 2000 on the Imnaha River.

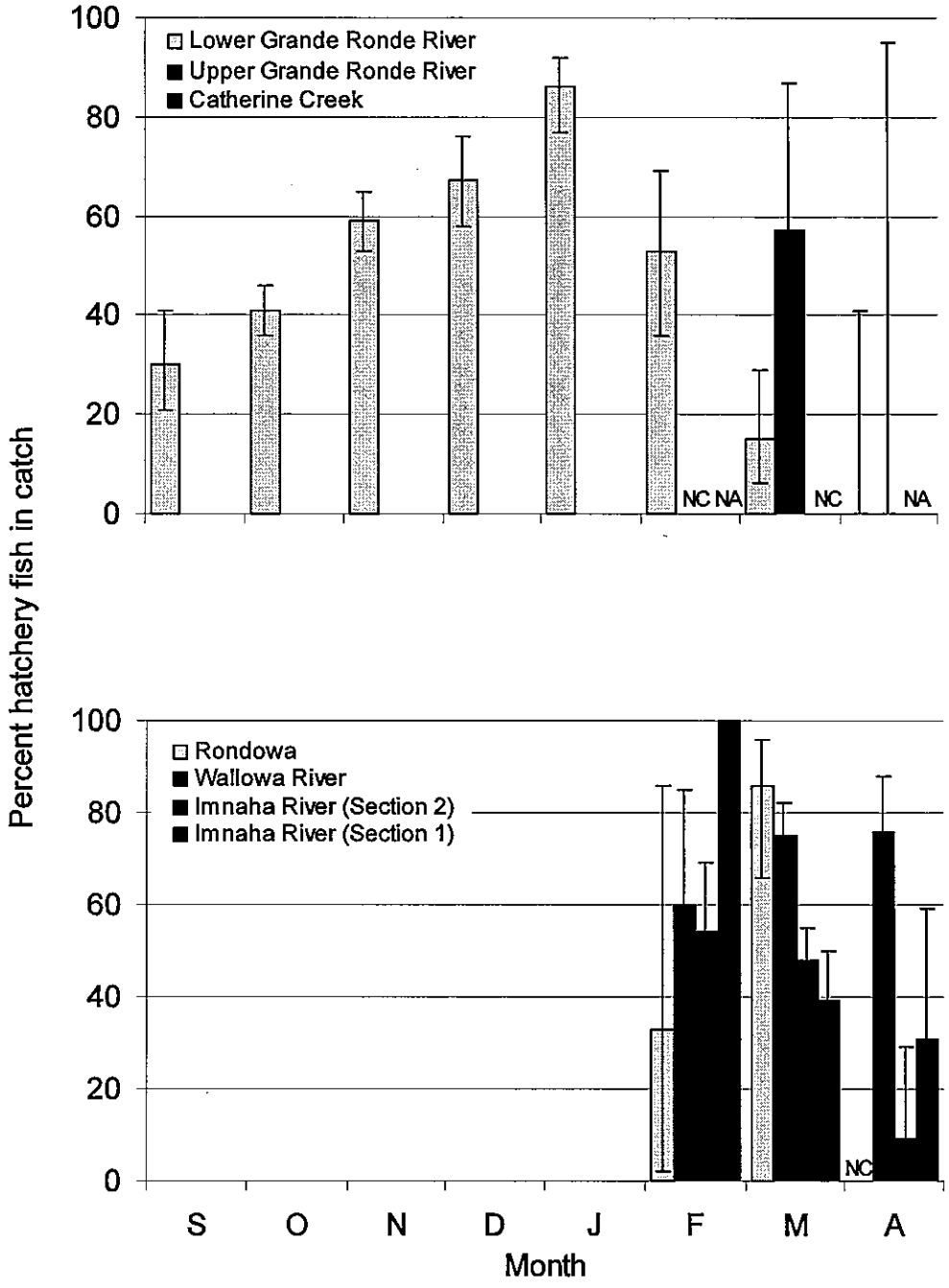

Figure 7. Estimated percent of summer steelhead caught (±95% C.I.'s; using a binomial distribution) in the Grande Ronde and Imnaha basins during the 1999-2000 run year that were hatchery fish. NC indicates no catch and NA indicates no anglers. Survey areas and times include the lower Grande Ronde River (1 September-to 15 April), upper Grande Ronde River, Catherine Creek, Rondowa, Wallowa River, and two sections of the Imnaha River (1 February-15 April).

Table 1. Percent age composition and mean fork length of hatchery summer steelhead sampled in creel surveys in the Grande Ronde and Imnaha basins during the 1999-2000 run year. Age composition estimated using age-length keys developed from scales and lengths of hatchery returns to Wallowa Hatchery and Little Sheep Creek Facility (Imnaha River) in 2000. No fish were caught in Catherine Creek. Age is expressed as years spent in freshwater prior to ocean migration:years spent in the ocean prior to spawning migration. Mean fork length includes ±95% confidence intervals.

Creel survey area, sex	N	Age composition (%) 1:1	1:2	1:3	Mean fork length (mm)
Lower GR River					
Males	50	82	18	0	627±12
Females	45	71	29	0	622±16
Total	95	77	23	0	625±10
Upper GR River					
Males	1	100	0	0	–
Females	3	67	33	0	652±64
Total	4	75	25	0	652±64
Rondowa					
Males	1	100	0	0	610
Females	6	50	50	0	641±69
Total	7	57	43	0	636±57
Wallowa River					
Males	46	83	17	0	630±14
Females	44	55	45	0	648±17
Total	90	69	31	0	639±11
Imnaha River					
Males	10	50	50	0	670±49
Females	21	43	57	0	666±30
Total	31	45	55	0	667±24

Table 2. Residence of summer steelhead anglers interviewed during creel surveys in the Grande Ronde and Imnaha basins during the 1999-2000 run year.

Creel survey area	Number of anglers	Percent Union or Wallowa counties	Other Oregon counties	Washington	Other states
Lower GR River	747	75	18	3	4
Upper GR River	106	89	10	0	1
Catherine Creek	9	78	22	0	0
Rondowa	38	84	11	0	5
Wallowa River	1043	67	29	2	2
Imnaha River	373	77	16	4	3

Table 3. Number of AdLV+CWT marked summer steelhead recovered during creel surveys in the Grande Ronde and Imnaha basins during the 1999-2000 run year. No AdLV+CWT marked fish were recovered in the upper Grande Ronde River or Catherine Creek. Recoveries were expanded for the entire fishery.

Creel survey area	Tag code	Release site	Experimental group[a]	Brood year	Number recovered	
					Observed	Expanded[b]
Lower Grande Ronde River	09 23 27	Deer Cr.	Volitional/April	97	1	5
	63 61 29	--	WDFW[c]	97	1	2
Wallowa River	07 53 30	Deer Cr.	Forced/F-S	96	1	ND
	09 18 25	Deer Cr.	Forced/S-F	96	2	ND
	09 18 26	Deer Cr.	Volitional/S-F	96	2	ND
	09 18 27	Deer Cr.	Volitional/F-S	96	3	ND
	09 23 25	Spring Cr.	Forced/May	97	1	ND
	09 23 26	Spring Cr.	Forced/April	97	1	ND
	09 23 27	Spring Cr.	Volitional/April	97	3	ND
	09 23 31	Deer Cr.	Forced/May	97	4	ND
Imnaha River	09 18 32	L. Sheep Cr.	S-F	96	2	4
	09 18 33	L. Sheep Cr.	F-S	96	1	4
	07 48 60	L. Sheep Cr.	1/4 density	97	4	15
	09 23 22	L. Sheep Cr.	1/2 density	97	2	5
	09 23 23	L. Sheep Cr.	1/2 density	97	2	6

[a] *S-F indicates slow growth (70% of allowable growth rate (AGR)) followed by fast growth (95-100% of AGR) and F-S indicates fast growth followed by slow growth within the two 8-12 week intervals from end of October through early March during rearing at Irrigon Hatchery. 1/4 and 1/2 density indicates either 1/4 or 1/2 of the standard rearing density (22 kg/cu m) in raceways at Irrigon Hatchery prior to release.*

[b] *ND indicates expansions not determined until statewide annual harvest card data become available.*

[c] *Steelhead with tagcode 63 61 29 were released by Washington Department of Fish and Wildlife (WDFW) in the Tucannon River, Washington, on 13 April 1998.*

At Rondowa, the catch rate index averaged 8 hours per fish (Figure 4, Appendix A-4). The percentage of steelhead caught that were hatchery fish ranged from 33% in February to 86% in March (Figure 7, Appendix B). Mean fork length (±95% confidence interval) of harvested hatchery steelhead was 610 mm for males and 641 (±69) mm for females (Table 1). Age composition of harvested hatchery steelhead was 57% 1:1's and 43% 1:2's. Sex composition was 14% male and 86% female (Table 1). Eighty-four percent of the anglers were from Union or Wallowa counties, 11% were from other Oregon counties and 5% resided outside the states of Oregon and Washington (Table 2). Anglers did not harvest any AdLV+CWT marked steelhead at Rondowa from our hatchery releases (Table 3).

On the Wallowa River, the catch rate index averaged 17 hours per fish (Figure 4, Appendix A-5). The percentage of steelhead caught that were hatchery fish ranged from 60% in February to 76% in April (Figure 7, Appendix B). Mean fork length (±95% confidence interval) of harvested hatchery steelhead was 630 (±14) mm for males and 648 (±17) mm for females (Table 1). Age composition of harvested hatchery steelhead

was 69% 1:1's and 31% 1:2's. Sex composition was 51% male and 49% female (Table 1). Sixty-seven percent of the anglers were from Union or Wallowa counties, 29% were from other Oregon counties, 2% were Washington State residents and 2% resided outside the states of Oregon and Washington (Table 2). On the Wallowa River, anglers harvested 17 AdLV+CWT marked steelhead from our hatchery releases, however, expanded estimates for the entire fishery will not be determined until state harvest punch card data become available (Table 3).

On the Imnaha River, we estimated that 1,022 anglers fished for 4,225 hours. They caught and released 190 wild and 50 hatchery steelhead and kept 98 hatchery steelhead for a catch rate index of 12 hours per fish (Figures 2-6, Appendices A-6 and A-7). The percentage of steelhead caught that were hatchery fish ranged from 9% in April in Section 2 to 100% in February in Section 1 (Figure 7, Appendix B). Mean fork length (±95% confidence interval) of harvested hatchery steelhead was 670 (±49) mm for males and 666 (±30) mm for females (Table 1). Age composition of harvested hatchery steelhead was 45% 1:1's and 55% 1:2's. Sex composition was 32% male and 68% female (Table 1). Seventy-seven percent of the anglers were from Union or Wallowa counties, 16% were from other Oregon counties, 4% were Washington State residents and 3% resided outside the states of Oregon and Washington (Table 2). On the Imnaha River, anglers harvested an estimated 34 AdLV+CWT marked steelhead from our hatchery releases (Table 3).

Angler effort (Figure 8) was 116% and harvest (Figure 9) was 156% of the previous year on the lower Grande Ronde River. Similarily, angler effort was 141% and harvest was 146% of the previous year on the Imnaha River. Catch rates improved (111% and 167% of the previous year) in the Grande Ronde and Imnaha river basins, respectively (Table 4). The best catch rate index observed was in March at Rondowa (8 hours/fish), while the poorest catch rate was on Catherine Creek where no fish were recorded being caught. The residence of anglers participating in summer steelhead fisheries in the Grande Ronde and Imnaha basins was similar to the previous year, with 22 percent of the anglers coming from Oregon counties other than Union and Wallowa (Figure 10). The Wallowa River fishery had the highest percentage (29%) of non-local Oregon anglers. The percentage of anglers from other states (5%) was the same as the previous year.

MANAGEMENT IMPLICATIONS AND RECOMMENDATIONS

The contribution of hatchery fish in northeast Oregon steelhead fisheries was significant during the 1999-2000 run year. One successful fishery was on the 24 river kilometer (15 mile) section of the lower Grande Ronde River near Troy, where anglers spent over 11,000 hours (2,100 angler days) fishing for summer steelhead. In this and other fisheries in the Grande Ronde and Imnaha basins, hatchery fish dominated the catch in just over one-half of the months surveyed. In addition, hatchery steelhead that were harvested composed almost 40% of the total catch on the lower Grande Ronde

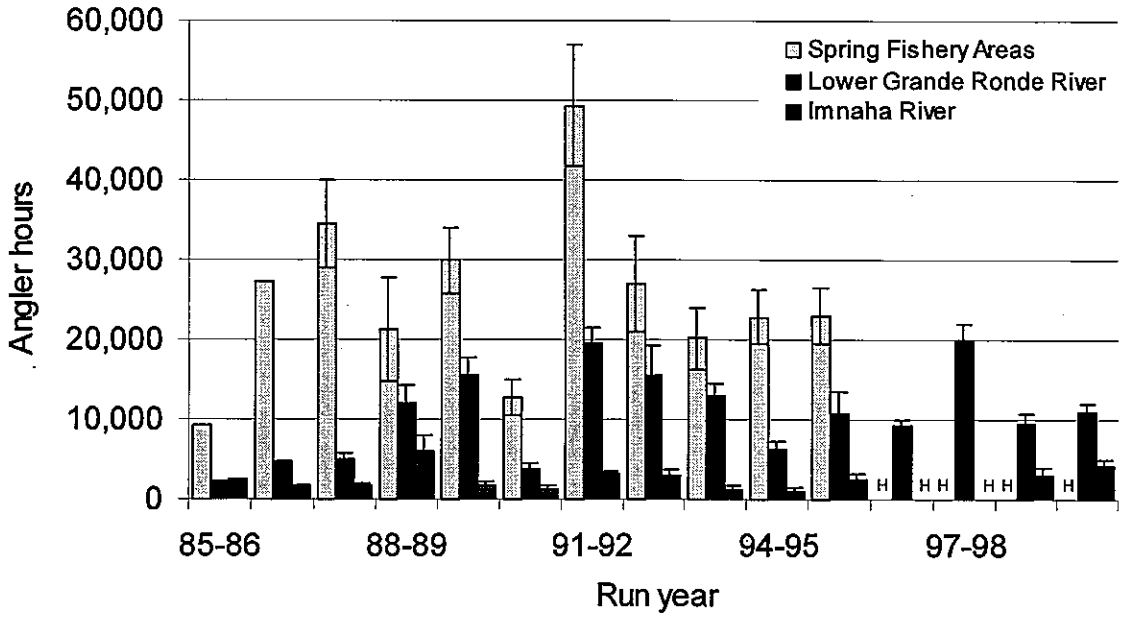

Figure 8. Angler effort for summer steelhead (± 95% C.I.'s) in spring fishery areas (upper Grande Ronde River, Wallowa River, Rondowa, and Catherine Creek), the lower Grande Ronde River, and the Imnaha River for the 1985-86 to 1999-2000 run years. H indicates this value must be estimated from harvest card data, which was not available when this report was submitted. Confidence intervals not available for the 85-86 and 86-87 run years.

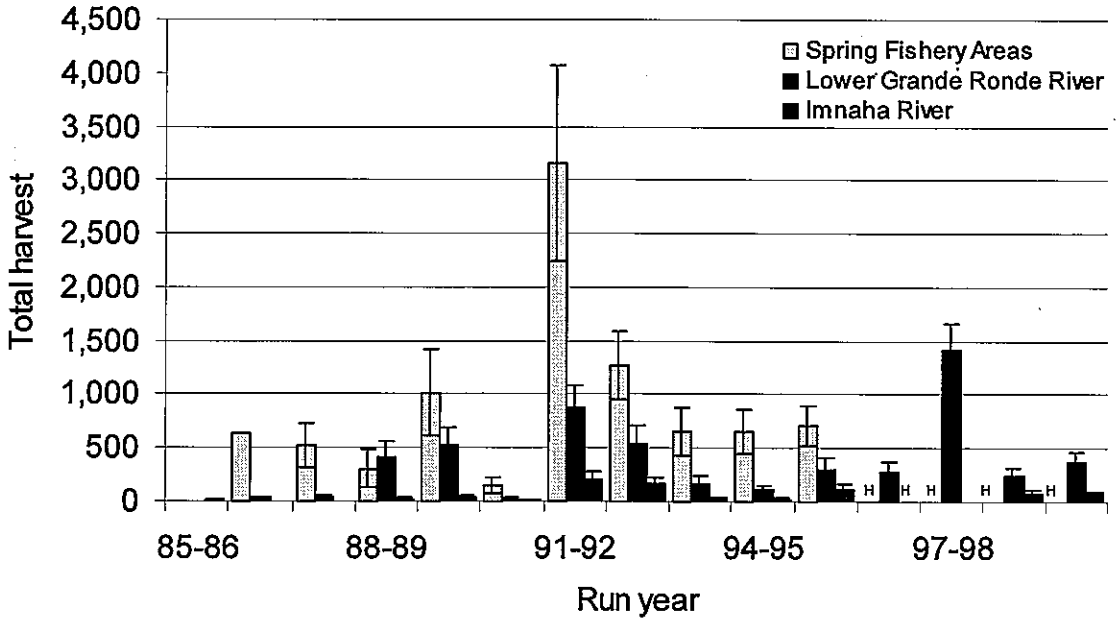

Figure 9. Number of hatchery summer steelhead harvested (± 95% C.I.'s) by recreational anglers in spring fishery areas (upper Grande Ronde River, Wallowa River, Rondowa, and Catherine Creek), the lower Grande Ronde River, and the Imnaha River for the 1985-86 to 1999-2000 run years. H indicates this value must be estimated from harvest card data, which was not available when this report was submitted. Confidence intervals not available for the 85-86 and 86-87 run years.

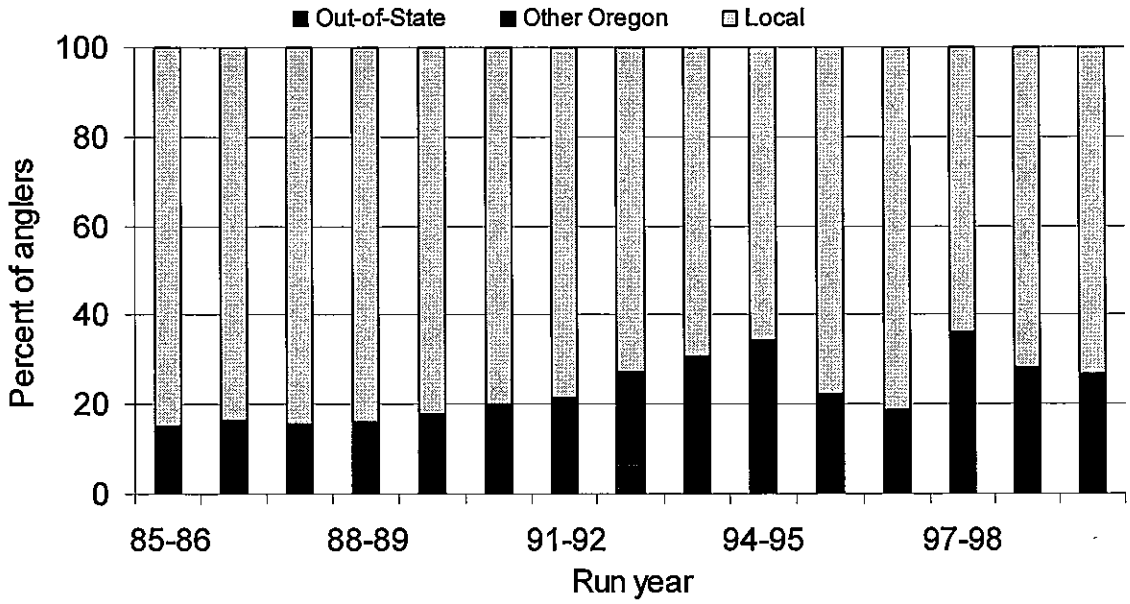

Figure 10. Percent of local (Union or Wallowa county), other Oregon county, and out-of-state anglers that fished in summer steelhead fisheries in the Grande Ronde and Imnaha basins for the 1985-86 to 1999-2000 run years.

Table 4. Catch rate index (h/fish ± 95% C.I.) in summer steelhead fisheries creel survey areas in the Grande Ronde and Imnaha basins for the 1985-86 to 1999-2000 run years. Note that a lower catch rate index implies greater angling success. "--" indicates not sampled or undefined.

Run year	Catch rate index (hours/fish)					
	Lower GR River	Upper GR River	Catherine Creek	Rondowa	Wallowa River	Imnaha River
85-86	8±7	--	--	--	7±7	15±7
86-87	9±3	--	--	--	11±3	9±8
87-88	10±4	--	--	11±9	16±3	24±9
88-89	14±4	40±55	--	--	43±21	18±11
89-90	14±4	14±8	--	34±27	17±5	20±8
90-91	19±8	24±11	--	--	6±2	13±6
91-92	11±3	10±3	3±3	6±1	10±2	4±1
92-93	9±2	14±4	49±49	--	11±2	8±1
93-94	18±5	31±17	--	12±4	17±3	13±3
94-95	21±6	25±13	--	15±5	17±3	17±8
95-96	11±2	15±4	--	--	21±4	7±2
96-97	14±4	18±9	33±69	--	13±3	6±2
97-98	7±1	13±9	7±10	11±6	10±1	18±9
98-99	17±4	19±9	14±20	--	18±4	20±7
99-2000	11±2	25±19	--	8±7	17±4	12±3

River and nearly 30% of the catch on the Imnaha River, representing sizable consumptive fisheries. These fisheries illustrate the importance of current hatchery programs to the success of recreational steelhead fisheries in the Grande Ronde and Imnaha basins.

Some of the highest catch rates in February and March were recorded at Rondowa, near the mouth of the Wallowa River, however public access is usually limited to either foot or all-terrain vehicle (ATV) traffic during this time of year. Providing road access through cooperative agreements with private landowners may increase angler effort in this productive fishery area.

We reduced the number of surveys on Catherine Creek in March and April because no anglers were observed in February. We recommend discontinuing sampling of Catherine Creek in the future due to the consistently low angler effort expended there during this and previous years. The elimination of hatchery releases of steelhead in Catherine Creek resulting from the present management program will likely continue to reduce angler effort.

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Appendix A-1. Fishery statistics for summer steelhead on the lower Grande Ronde River during the 1999-2000 run year. Statistics include mean estimates (±95% confidence intervals) except for catch rate when expressed as h/fish. Only adipose fin-clipped fish were harvested. "–" indicates not sampled or undefined.

Month,	Sample size		Total	Total	Total	Catch rate		Angler
day type	Days	Anglers	hours	catch	harvest	fish/h	(h/fish)	days
September:								
Weekday	7	23	511±293	46±55	8±14	0.091±0.107(11)		108±62
Weekend	5	29	300±76	33±17	6±7	0.110±0.057(9)		76±19
Total	12	52	811±303	79±57	14±15	0.098±0.071(10)		184±69
October:								
Weekday	7	90	1683±234	193±59	61±33	0.114±0.035(9)		308±43
Weekend	5	98	1801±246	153±50	55±45	0.085±0.028(12)		315±43
Total	12	188	3484±340	346±78	116±56	0.100±0.022(10)		623±61
November:								
Weekday	6	124	2293±296	229±72	95±51	0.100±0.031(10)		356±46
Weekend	5	73	617±220	20±10	7±7	0.031±0.017(32)		107±38
Total	11	197	2910±369	249±73	102±51	0.086±0.025(12)		463±59
December:								
Weekday	7	41	794±355	62±39	32±25	0.079±0.049(13)		131±59
Weekend	5	56	503±150	63±32	30±20	0.125±0.063(8)		86±26
Total	12	97	1297±385	125±50	62±32	0.097±0.039(10)		217±64
January:								
Weekday	6	34	606±373	42±28	37±26	0.070±0.046(14)		132±81
Weekend	6	48	604±299	51±30	27±21	0.085±0.050(12)		118±58
Total	12	82	1210±478	93±41	64±33	0.077±0.034(13)		250±99
February:								
Weekday	6	27	357±188	7±8	0	0.020±0.021(50)		100±53
Weekend	5	45	544±116	29±19	16±14	0.054±0.035(19)		145±31
Total	11	72	901±221	36±20	16±14	0.040±0.023(25)		245±60
March:								
Weekday	8	25	247±139	38±44	6±11	0.150±0.176(7)		119±67
Weekend	4	23	146±91	2±3	0	0.014±0.019(71)		47±29
Total	12	48	393±166	40±44	6±11	0.099±0.111(10)		166±70
April:								
Weekday	3	2	48	0	--	--		13
Weekend	4	9	58±33	6±11	0	0.108±0.182(9)		11±6
Total	7	11	106±33	6±11	0	0.059±0.100(17)		24±7
Grand total	89	747	11112±893	974±146	380±92	0.088±0.013(11)		2172±175

Appendix A-2. Catch rate for summer steelhead on the upper Grande Ronde River during the 1999-2000 run year. Only adipose fin-clipped fish were harvested. "--" indicates not sampled or undefined.

Month, day type	Sample size		Catch rate	
	Days	Anglers	fish/h	(h/fish)
February:				
Weekday	12	14	0.000	--
Weekend	6	3	0.000	--
Total	18	17	0.000	--
March:				
Weekday	8	45	0.058	(17)
Weekend	5	30	0.049	(21)
Total	13	75	0.055	(18)
April:				
Weekday	1	1	0.000	--
Weekend	5	15	0.022	(46)
Total	6	16	0.021	(47)
Grand total	37	108	0.040	(25)

Appendix A-3. Catch rate for summer steelhead on Catherine Creek during the 1999-2000 run year. Only adipose fin-clipped fish were harvested. "--" indicates not sampled or undefined.

Month, day type	Sample size		Catch rate	
	Days	Anglers	fish/h	(h/fish)
February:				
Weekday	12	0	--	--
Weekend	6	0	--	--
Total	18	0	--	--
March:				
Weekday	1	2	0.000	--
Weekend	3	5	0.000	--
Total	4	7	0.000	--
April:				
Weekday	0	0	--	--
Weekend	2	2	0.000	--
Total	2	2	0.000	--
Grand total	24	9	0.000	--

Appendix A-4. Catch rate for summer steelhead at Rondowa during the 1999-2000 run year. Only adipose fin-clipped fish were harvested. "--" indicates not sampled or undefined.

Month, day type	Sample size		Catch rate	
	Days	Anglers	fish/h	(h/fish)
February:				
Weekday	3	2	0.000	--
Weekend	2	5	0.131	(8)
Total	5	7	0.095	(11)
March:				
Weekday	7	17	0.202	(5)
Weekend	6	10	0.077	(13)
Total	13	27	0.147	(7)
April:				
Weekday	2	4	0.000	--
Weekend	5	0	0.000	--
Total	7	4	0.000	--
Grand total	25	38	0.120	(8)

Appendix A-5. Catch rate for summer steelhead on the Wallowa River during the 1999-2000 run year. Only adipose fin-clipped fish were harvested.

Month, day type	Sample size		Catch rate	
	Days	Anglers	fish/h	(h/fish)
February:				
Weekday	12	120	0.023	(43)
Weekend	6	133	0.014	(72)
Total	18	253	0.018	(54)
March:				
Weekday	9	267	0.067	(15)
Weekend	7	343	0.065	(15)
Total	16	610	0.066	(15)
April:				
Weekday	3	42	0.062	(16)
Weekend	5	138	0.087	(12)
Total	8	180	0.083	(12)
Grand total	42	1043	0.059	(17)

Appendix A-6. Fishery statistics for summer steelhead in Section 2 (mouth to Fence Creek) of the Imnaha River during the 1999-2000 run year. Statistics include mean estimates (±95% confidence intervals) except for catch rate when expressed as h/fish. Only adipose fin-clipped fish were harvested. "--" indicates not sampled or undefined.

Month,	Sample size		Total	Total	Total	Catch rate		Angler
day type	Days	Anglers	hours	catch	harvest	fish/h	(h/fish)	days
February:								
Weekday	6	31	647±279	32±40	12±15	0.048±0.052	(21)	121±52
Weekend	6	29	203±67	5±5	0	0.026±0.012	(38)	43±14
Total	12	60	850±287	37±40	12±15	0.043±0.040	(23)	164±55
March:								
Weekday	8	79	1229±473	118±55	48±28	0.096±0.036	(10)	265±102
Weekend	4	70	749±288	61±17	17±6	0.082±0.016	(12)	174±67
Total	12	149	1978±554	179±58	65±29	0.091±0.023	(11)	439±123
April:								
Weekday	4	5	111±107	0	--	--		14±13
Weekend	4	69	400±35	22±15	1±2	0.057±0.016	(17)	102±9
Total	8	74	511±113	22±15	1±2	0.045±0.013	(22)	116±26
Grand total	32	283	3339±634	238±72	78±33	0.071±0.017	(14)	719±137

Appendix A-7. Fishery statistics for summer steelhead in Section 1 (Fence Creek to town of Imnaha) on the Imnaha River during the 1999-2000 run year. Statistics include mean estimates (±95% confidence intervals) except for catch rate when expressed as h/fish. Only adipose fin-clipped fish were harvested. "--" indicates not sampled or undefined.

Month,	Sample size		Total	Total	Total	Catch rate		Angler
day type	Days	Anglers	hours	catch	harvest	fish/h	(h/fish)	days
February:								
Weekday	6	5	61±53	4±6	0	0.064±0.038	(16)	19±17
Weekend	6	1	4±4	0	--	--		1±1
Total	12	6	65±53	4±6	0	0.060±0.036	(17)	20±16
March:								
Weekday	8	35	530±273	73±99	16±25	0.139±0.132	(7)	197±101
Weekend	4	14	102±46	10±16	0	0.100±0.110	(10)	29±13
Total	12	49	632±277	83±100	16±25	0.133±0.112	(8)	226±99
April:								
Weekday	4	3	23±35	0	--	--		10±15
Weekend	4	32	166±65	13±6	4±3	0.073±0.017	(14)	47±18
Total	8	35	189±74	13±6	4±3	0.064±0.015	(16)	57±22
Grand total	32	90	886±291	100±101	20±25	0.113±0.080	(9)	303±100

Appendix B. Percent of hatchery summer steelhead caught during each survey month in the Grande Ronde and Imnaha basins during the 1999-2000 run year. Total catch for the Lower Grande Ronde and Imnaha rivers and sampled catch for the Upper Grande Ronde and Wallowa rivers and Catherine Creek are shown in parentheses. On the Imnaha River, Section 2 is from the mouth upstream to Fence Creek, and Section 1 is from Fence Creek upstream to the town of Imnaha. "--" indicates not sampled or undefined.

Creel survey area	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr
Lower GR River	30(79)	41(346)	59(249)	67(125)	86(93)	53(36)	15(40)	0(6)
Upper GR River	--	--	--	--	--	--(0)	57(7)	0(1)
Catherine Creek	--	--	--	--	--	--(--)	--(0)	--(0)
Rondowa	--	--	--	--	--	33(3)	86(22)	--(0)
Wallowa River	--	--	--	--	--	60(10)	75(114)	76(34)
Imnaha River (Section 2)	--	--	--	--	--	54(37)	48(179)	9(22)
Imnaha River (Section 1)	--	--	--	--	--	100(4)	39(83)	31(13)

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